

Att'y Ref. No.: 003-065

U.S. App. No.: 10/621,379

**REMARKS**

Favorable reconsideration, reexamination, and allowance of the present patent application are respectfully requested in view of the foregoing amendments and the following remarks.

**Information Disclosure Statement (IDS)**

At page 3 of the Office Action, the IDSs filed 24 October 2003 and 17 June 2004 were referenced, and Applicant notes receipt with the Office Action of copies of the form PTO-1449 that accompanied each IDS. Applicant notes, however, that the one document cited in the October 24<sup>th</sup> IDS, EP 623786 A1, was stricken through, apparently indicating that it was not considered, although no explanation for this action was provided in the Office Action. Applicant respectfully requests reconsideration of this apparent objection, and full consideration of the document cited in the October 24<sup>th</sup> IDS.

Applicant's undersigned representative has reviewed the Image File Wrapper ("IFW") for this application, and has confirmed that a copy of the aforementioned document is of record in the application, labeled "Foreign Reference", October 24, 2003, fifteen (15) pages. Applicant also notes that this document was discussed at length in the present specification beginning at page 1.

For at least the foregoing reasons, Applicant respectfully submits that the 24 October 2003 IDS fully complied with 37 C.F.R. §§ 1.97, 1.98, and therefore respectfully requests withdrawal of the objection thereto, consideration of the document cited therein, and return to Applicant of a copy of the Examiner-initialed PTO-1449.

**Objection to the Drawings**

At page 3 of the Office Action, the drawings were objected to under 37 C.F.R. § 1.84 because Figs. 1 and 2 allegedly require correction. Applicant respectfully requests reconsideration of this objection.

Applicant files concurrently herewith Replacement Sheets for Figs. 1 and 2, in which the legends for these figures include the annotation "(Prior Art)".

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For at least the foregoing reasons, Applicant respectfully submits that the drawings fully comply with 37 C.F.R. § 1.84, and therefore respectfully requests withdrawal of the objection thereto.

### **Objection to the Specification**

At page 5 of the Office Action, the Specification was objected to because it allegedly contained informalities. More specifically, the description at pages 7-8 was objected to because reference is made to Figs. 4 and 5, while the drawings include Figs. 4a, 4b, 5a, and 5b; and the description at page 10 was accused of being redundant. Applicant respectfully requests reconsideration of this objection.

M.P.E.P. § 608.01(f) states, in part:

The examiner should see to it that the figures are correctly described in the brief description of the drawing, that all section lines used are referred to, and that all needed section lines are used. *If a figure contains several parts, for example, figure 1A, 1B, and 1C, the figure may be described as figure 1.* If only figure 1A is described in the brief description, the examiner should object to the brief description, and require applicant to either add a brief description of figure 1B and 1C or describe the figure as "figure 1."

(emphasis added) Accordingly, Applicant respectfully submits that referring to Figs. 4a and 4b as "Fig. 4", and Figs. 5a and 5b as "Fig. 5", are accepted practice. Concerning the description at page 10, Applicant elects at this time to keep this disclosure, as it is part of the original application and further assists the skilled artisan in understanding the principles of the present invention.

For at least the foregoing reasons, Applicant respectfully submits that the Specification is not objectionable, and therefore respectfully requests withdrawal of the objection thereto.

### **Rejection under 35 U.S.C. § 102**

In the Office Action, beginning at page 5, Claims 1-17 were rejected under 35 U.S.C. § 102(b), as reciting subject matters that allegedly are anticipated by U.S. Patent No. 5,735,126,

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issued to Schulte-Werning. Beginning at page 18, Claims 1-8, 10-12, 14, and 16 were rejected under 35 U.S.C. § 102(b), as reciting subject matters that allegedly are anticipated by U.S. Patent No. 5,513,982, issued to Althaus et al. ("Althaus '982"). Beginning at page 33, Claims 1-12, 14, and 16 were rejected under 35 U.S.C. § 102(b), as reciting subject matters that allegedly are anticipated by U.S. Patent No. 5,518,311, issued to Althaus et al. ("Althaus '311").

Applicants respectfully request reconsideration of these rejections.

Applicant first notes that the Office Action includes, below each rejection under section 102, the complete text of each of *Schulte-Werning*, *Althaus '982*, and *Althaus '311*, respectively. While Applicant has reviewed the 48 pages of the Office Action, it appears that the only text added to the wholesale copying of the prior art's descriptions are at: page 5, last three lines, to page 6, first three lines; page 18, last three lines, to page 19, first two lines; and page 33, last paragraph. If the patent examiner has added any other text to the Office Action, he is invited to specifically point it out to Applicant.

This application describes vortex generators in a flow duct to which a fluid medium is applied, and methods for controlling the wake flow of a vortex generator in a flow duct to which a fluid medium is applied. Vortex generators *per se* are known; indeed, page 1 of this application describes one such device. An aspect of the present application is thus a further refinement of generic vortex generators. By practical use of such vortex generators, the inventors herein found that, in the presence of changing flow conditions, there is a risk of vortex breakdown in the wake of the vortex generator. This problem is discussed in the application in detail.

It was found by the inventors that vortex breakdown could be avoided. Thus, one principle of the present invention is to increase the axial speed in the vortex core by introducing an axial impulse into the core flow of the wake behind the vortex generator, e.g., by the targeted introduction of an axially flowing secondary medium into the core flow of the wake. None of the cited prior art documents recognize the problem to which the claimed combinations are solutions, and therefore understandable fail to disclose the targeted introduction of an axial impulse into the core flow of the wake, e.g., by the targeted introduction of an axially flow into

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the core flow.

Claim 1 relates to a vortex generator having a combination of elements including, *inter alia*, at least one outlet opening configured and oriented relative to vortex generator surfaces to introduce a targeted secondary flow into the core flow of a wake vortex formed by said vortex generator surfaces when a fluid medium flows through a flow duct.

Claim 10 relates to a method for controlling the wake flow of a vortex generator in a flow duct to which a fluid medium is applied, the method having a combination of steps including, *inter alia*, introducing an axial impulse in the zone of the core flow of the forming wake vortices at least approximately in the direction of the main flow.

The prior art, including *Schulte-Werning*, *Althaus '982*, and *Althaus '311*, fails to identically disclose or describe combinations of elements or steps as recited in the pending claims.

Applicant notes that minor editorial and stylistic amendments have been made to Claim 1.

*Schulte-Werning* describes equipping vortex generators with openings for introducing mixing air into a hot gas flow (see abstract). The distribution of the openings and their exhaust rate is adjusted to achieve rapid mixing and, if necessary, film cooling of the duct walls. The openings, arranged in a row either on the duct wall or on the surface of the vortex generator, have a uniform size and configuration in the respective row. Therefore, as can be seen from Figures 1 and 9-14, the exhaust of the openings along the whole height, length, or width of the vortex generator is uniform. Consequently, none of the discussed embodiments in *Schulte-Werning* is configured and oriented relative to the vortex generator surfaces to introduce a targeted secondary flow into the core flow of a wake vortex formed by the vortex generator surfaces when a fluid medium flows through a flow duct. Furthermore, *Schulte-Werning* is entirely silent about the use of his device to control the wake flow of a vortex generator, contrary to the position taken in the Office Action, and thus fails to describe a method including introducing an axial impulse in the zone of the core flow of the forming wake vortices at least approximately in the direction of the main flow.

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*Althaus '982*, the European version, is discussed in the application at page 1 in detail. Under changing flow conditions, these vortex generators produce a vortex breakdown in the wake and nothing is disclosed in *Althaus '982* to avoid such a breakdown by introducing an axial impulse. Therefore, none of the embodiments discussed in *Althaus '982* is configured and oriented relative to the vortex generator surfaces to introduce a targeted secondary flow into the core flow of a wake vortex formed by the vortex generator surfaces when a fluid medium flows through a flow duct. *Althaus '982* is also entirely silent about the use of his device to control the wake flow of a vortex generator, contrary to the position taken in the Office Action, and thus fails to describe a method including introducing an axial impulse in the zone of the core flow of the forming wake vortices at least approximately in the direction of the main flow.

*Althaus '311* discloses a generic vortex generator in a flow duct including a plurality of outlet openings for admixing a secondary gas. These openings are uniformly distributed along the top surface or along the edges of the vortex generator. Fig.9 describes a slot 22e in the duct wall 21a before the vortex generator. Neither this uniform arrangement of openings along the surfaces or edges, nor the arrangement of a slot in the duct wall, result in a targeted introduction of medium into the core flow of the wake. The arrangement of openings disclosed in *Althaus '311* does not have any influence on the axial speed in the vortex core of the wake, and therefore fails to identically disclose or describe the combination of structures recited in Claim 1, or the combination of steps recited in Claim 10, in the same way that *Schulte-Werning* and *Althaus '982* fail.

For at least the foregoing reasons, Applicant respectfully submits that the subject matters of each of Claims 1-17 are not anticipated by *Schulte-Werning*, *Althaus '982*, or *Althaus '311*, are therefore not unpatentable under 35 U.S.C. § 102(b), and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 102(b).

#### **Rejection under 35 U.S.C. § 103(a)**

In the Office Action, beginning at page 47, Claim 9 was rejected under 35 U.S.C. § 103(a), as reciting subject matter that allegedly is obvious, and therefore allegedly unpatentable,

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over each of the disclosures of *Schulte-Werning*, *Althaus '982*, and *Althaus '311*, each taken alone. Applicant respectfully requests reconsideration of this rejection.

Claim 9 depends from Claim 1, and is therefore allowable for at least the same reasons. None of *Schulte-Werning*, *Althaus '982*, and *Althaus '311* disclose, describe, or suggest the differences between each document and the subject matters recited in Claims 1 and 9. Accordingly, the rejection of Claim 9 is not supported by a *prima facie* case, and is therefore improper.

For at least the foregoing reasons, Applicant respectfully submits that the subject matter of Claim 9 would not have been obvious to one of ordinary skill in the art at the time of Applicant's invention, are therefore not unpatentable under 35 U.S.C. § 103(a), and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 103(a).

#### **Conclusion**

Applicant respectfully submits that the present patent application is in condition for allowance. An early indication of the allowability of this patent application is therefore respectfully solicited.

If Mr. Cooley believes that a telephone conference with the undersigned would expedite passage of this patent application to issue, he is invited to call on the number below.

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It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. If, however, additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and the Commissioner is hereby authorized to charge fees necessitated by this paper, and to credit all refunds and overpayments, to our Deposit Account 50-2821.

Respectfully submitted,

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